

## ASOS MODIFICATION NOTE 4 (for Electronics Technicians)

Engineering Division

W/OSO321:BGM

**SUBJECT** : Replacement Battery Box Lids for ACU and DCP

**PURPOSE** : To provide a sealed connector on the ACU and DCP battery box lid to prevent sparks from igniting hydrogen when cables to the battery boxes are disconnected.

**EQUIPMENT AFFECTED** : Automated Surface Observing System (ASOS)

**PARTS REQUIRED** : ACU battery box lid P/N 62828-90031-1LID  
Label P/N 62828-40063-10-MOD 1  
DCP battery box lid P/N 62828-90031-2LID  
Label P/N 62828-40062-10 MOD 1

**MOD PROCUREMENT:** Order parts from NLSC as ASOS Field Modification Kits ASN S100-FMK028-038 and ASN S100-FMK028-LABEL. There is no charge for these items. ECP: E92SM05F047. See appendix 'A' for specific sites.

**SPECIAL TOOLS REQUIRED** : None

**TIME REQUIRED** : 1.5 hour

**EFFECT ON OTHER INSTRUCTIONS**: None

**CERTIFICATION STATEMENT** : This modification was tested for operational integrity by the Test & Evaluation Branch at Sterling, VA.

**GENERAL**

This note provides installation instructions for removing and replacing the ACU and DCP battery box lid assemblies. Caution must be used while replacing the battery box lids. Listed in Appendix A are sites that require both ACU and DCP lid replacements and sites that only require a label be attached to the existing battery box lids.

**PROCEDURE**

1. Call the AOMC at 1-800-242-8194. Provide the AOMC the SID for the site at which you will be installing the modification. Confirm that AOMC will provide access to the site-specific data base.
2. For commissioned sites, get approval of the responsible MIC/OIC before starting modification. For noncommissioned sites, coordinate with the site MIC/OIC before

starting modification. You may modify on any day of the month if permission is granted and the restrictions in steps 3 and 4 are complied with.

3. Commissioned Sites Only: Do **not** start modification during bad weather, precipitation, instrument flight rule (IFR) conditions, or if any of those conditions is expected within 3 hours. These meteorological conditions will be defined by the responsible MIC/OIC.
4. Do not start modification at a time that will conflict with scheduled synoptic observations at 00, 03, 06, 09, 12, 15, 18, and 21Z. Although about 1.5 hours should be sufficient, allow 2 hours to complete the modification and restart ASOS.
5. Immediately before beginning work at NWS staffed sites, the MIC/OIC/ observer will inform the tower and any other critical users the ASOS will be shut off for modification installation purposes (at unstaffed sites, the el tech will inform tower). He/She will alert towers using Controller Video Displays (CVD) and Operator Interface Devices (OID) to log off and shut down display power to avoid confusion. At commissioned sites only, download the following data to laptop using the direct command mode: 5-minute data (12 hrs.), and SYSLOG information (24 hrs.), SHEF messages (24 hrs.), and any 2-hour archive files.
6. Do not halt ASOS until immediately after an hourly observation has been transmitted. At NWS-staffed sites, normal backup observing procedures will be implemented.
7. Make appropriate entries in the SYSLOG using the Maintenance Action keys, Field Modification keys, and comment fields. Follow these steps:

Log on as TECH.

Key the MAINT screen.

Key the ACTION page.

Key the Start key.

Exit; complete the modification.

Log on as TECH once modification has been completed.

Key the MAINT screen.

Key the ACTION page.

Key FMK. Enter the Modification Note number as follows: MOD 4. On the second line of the screen verify that only MOD 4 is displayed. Complete by entering Y in the Y/N if only MOD 4 is displayed.

Check the SYSLOG and verify the FMK message. Notify the AOMC via the telephone that MOD 4 is complete.

## **A. REPLACING BATTERY BOX LID IN DCP**

Tools Required:      Medium flat-tipped screwdriver  
                             Two 5/16-inch box wrenches  
                             5/8-inch nut driver  
                             3/8-inch nut driver  
                             No. 2 Phillips screwdriver

### **WARNING**

**Death or severe injury may result if power is not removed from DCP before performing maintenance.**

1. Coordinate with site observer, if applicable, and make an entry in the SYSLOG.
2. Set **OUTPUT POWER** switch S1 on UPS status panel to OFF (0) position. OUTPUT indicator on status panel extinguishes.
3. Set primary Circuit Breaker Module A1A3A1 to OFF position.
4. Remove facility power from the DCP equipment cabinet by setting DCP circuit breaker in ac junction box to off.
5. Loosen hose clamp on battery box vent tube and remove tubing from top of battery box.

### **WARNING**

**The battery box is heavy (75 pounds) and should be slid, not lifted. If lifted, two people or mechanical lift is required. Failure to comply may result in injury to personnel or damage to equipment.**

6. Slide battery box forward as far as possible so that rear of box rests on front edge of DCP cabinet while box is retained by the attached lanyards on each side.
7. Slide retaining straps off of left and right top of battery box.

### **CAUTION**

When lifting top of battery box, do not pull the attached wires off the connector.

8. Carefully lift top off of battery box and allow battery box to vent with top off for 5 minutes.
9. Disconnect cable from top of battery box by grasping both sides of cable connector between thumb and index finger, applying inward pressure, and pulling connector free.

**NOTE:** Inspect the connector on the battery box lid from the inside looking out. Look for adhesive in the connector pin cavities and the use of PVC wire. The adhesive must be hard epoxy or hot glue type (RTV is not correct). Modified batteries will be identified with a label including part number and the word "MOD 1."

If there is no adhesive used in connector cavities go to step 10.

If there is RTV adhesive used in the connector cavities go to step 10.

If Teflon wire (feels slick) is used in the connector go to step 10.

If connector cavities are filled with epoxy and PVC wire is used but labeled with "part number" and "MOD 1" nomenclature is missing, go to step 14 (apply label).

10. Using two 5/16-inch wrenches, remove bolt, flat washers, lock washer and nut from negative terminal of battery BT1 (connected to top of battery box via black wires). Remove black wires from negative terminal.
11. Using two 5/16-inch wrenches, remove bolt, flat washers, lockwasher and nut from positive terminal of battery BT5 (connected to top of battery box via red wires). Remove red wires from positive terminal and remove top of battery box.
12. Position replacement battery box top to allow connection of red wires to positive terminal of battery BT5 and black wires to negative terminal of BT1.
13. Using markers as a guide and two 5/16-inch box wrenches, install bolts, flat washers, and nuts securing wires to their respective terminals.
14. Install top on battery box and press into place.  
  
Apply label (supplied with this mod. kit) to lid. Apply label looking at lid top view with the connector on right side and the vent on left side. Measure 4 inches from the right edge toward center and 2 inches from the bottom edge toward center. This position should put the label approximately 1.25 inch below connector.
15. Pull two retaining straps over top of battery box to secure top.
16. Using flat-tipped screwdriver, install battery box vent tube.
17. Position cable connector on top of battery box and press connector into place. Ensure that battery cable connector is fully seated and locked in place.
18. Slide battery back into original position inside DCP.
19. Apply facility power to DCP equipment cabinet by setting DCP circuit breaker in ac junction box to ON position.
20. Set primary Circuit Breaker Module A1A3A1 to ON position.
21. Set OUTPUT POWER switch S1 on UPS status panel to ON (1).

22. Coordinate with site observer, if applicable, and clear any maintenance flags generated, making an entry in the SYSLOG.

## **B. REPLACING BATTERY BOX LID IN ACU**

Tools Required:      Two 5/16-inch box wrenches  
                             No. 2 Phillips screwdriver  
                             Small screwdriver

### **WARNING**

**Death or severe injury may result if power is not removed from ACU before performing maintenance. Ensure that output power switch is set to 0 (off) and facility power is removed from ACU.**

1. Set OUTPUT POWER switch on UPS status panel to 0 (OFF) position. OUTPUT indicator on status panel extinguishes.
2. Remove facility power from ACU.
3. On Battery Box 1A8, disconnect cable connector from battery box connector **J1** by squeezing tabs on side of connector inward while rocking the connector free.
4. Wait at least 30 seconds while UPS capacitors discharge through bleeders and other drains. ACU blower 1B1 must be removed to access battery box 1A8.
5. Using small screwdriver, tag and remove three blower AC power wires from AC Power Distribution Assembly 1A7 terminals 1A7-18D, -19D, and -20D or cut TY-Wraps and remove blower.

**NOTE:**      There are two types of cabinets for the ACU. One type has a partial length front door with the blower mounted behind an air intake grill. The other type of cabinet has a full length door with the blower accessible with the door open.

6. If ACU cabinet has a partial length front door, using Phillips screwdriver, remove six Phillips screws and lockwashers securing air intake grill to lower front of cabinet. Remove air intake grill.
7. If ACU cabinet has a full length front door, open front door. Loosen knurled knobs on each side of shield in front of blower B1 and remove shield.
8. Remove air filter from blower.
9. Using Phillips screwdriver, remove four screws, lockwashers, and flat washers securing blower to ACU cabinet.
10. Remove blower from cabinet.

### CAUTION

Pressure sensors in RF/Pressure Mounting Shelf 1A6 are safety-critical devices. Pressure sensors may output erroneous readings if plastic vent tubing to I/O panel assembly is damaged or crimped. Throughout this procedure, exercise caution to avoid damage to pressure vent tubing.

11. Disconnect retaining strap securing battery box 1A8 to inside of ACU cabinet.

### WARNING

**Battery box is heavy (75 lbs) and should be slid, not lifted. If lifted, two people or mechanical lift is required. Failure to comply may result in injury to personnel or damage to equipment.**

12. Slide Battery Box 1A8 from ACU cabinet through blower opening.

### CAUTION

When lifting top of battery tray, do not pull the attached wires off the connector.

13. Lift top of battery box and position so that battery terminals can be accessed.

### WARNING

**Severe injury may result if the negative and positive battery terminals are shorted together. Exercise caution while performing maintenance on batteries.**

**NOTE:** Inspect the connector on the battery box lid from the inside looking out. Look for adhesive filling the connector pin cavities and the use of PVC wire. The adhesive must be hard epoxy or hot glue type (RTV is not correct). Modified batteries will be identified with a label including part number and the words "MOD 1".

If there is no adhesive in connector cavities go to step 14.

If there is RTV adhesive used in the connector cavities go to step 14.

If Teflon wire is used in the connector go to step 14.

If connector cavities are filled with epoxy and PVC wire is used but labeled with "part number" and "MOD 1" nomenclature is missing, go to step 17 (apply label).

14. Using two 5/16-inch box wrenches, remove bolt, flat washers, lockwasher, and nut from negative terminal of battery BT1 (connected to top of battery box via black wires). Remove black wires from negative terminal.
15. Using two 5/16-inch box wrenches, remove bolt, flat washers, lockwasher, and nut from positive terminal of battery BT5 (connected to top of battery box via red wires). Remove red wires from positive terminal.
16. Position replacement battery box top to allow connection of red wires to positive terminal of battery BT5 and black wires to negative terminal of BT1.
17. Using two 5/16-inch box wrenches, install bolt, flat washers, lockwasher, and nut securing wires to respective terminals. Position top over battery box and press into place.  
  
Apply label (supplied with this mod. kit) to lid. Apply label looking at lid top view with the connector on right side and the vent on left side. Measure 4 inches from the right edge toward center and 2 inches from the bottom edge toward center. This position should put the label approximately 1.25 inch below connector.
18. Slide battery box into ACU cabinet through blower opening. While taking care not to damage or crimp pressure sensor vent tubing, position box with connector J1 to right and two rear corners in contact with vertical plates. Secure battery box in position by installing retaining strap to left and right vertical plates.
19. Install blower into ACU cabinet using four screws, flat washers, and lockwashers. Install air filter in blower.
20. Install intake grill or blower shield, depending on which type of cabinet you have.
21. Using small screwdriver and tags as guide, install three blower AC power wires to AC Power Distribution Assembly 1A7 terminals 1A7-18D, -19D, and -20D.
22. Position battery plug over connector on the top of battery tray and press into place, ensuring that battery plug is fully seated and locked into place.
23. Apply facility power to ACU cabinet.
24. Set Output power switch to 1 (on) position. Check for proper operation. Verify accuracy of pressure sensor data using portable pressure standard. This procedure can be found in the ASOS Site Technical Manual, table 8.5.2.
25. After the modification has been completed, package the battery box lids for shipment to NRC. Complete and attach a WS Form H-14 for each component returned. Items being returned should include 2 each ASN S100-1A8A1A1 battery box lids for the ACU and DCP.

This completes the modification.

## **REPORTING MODIFICATION:**

Target date for completing this modification is 45 days after receipt of parts. Notify the AOMC before starting the modification. Report completed modification on WS Form A-26, Maintenance Report, per instructions in EHB-4, part 2, using reporting code ACU.

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Chief, Engineering Division

Attachment

W/OSO321:BGMcCormick:rhz:redone 10/20/94:disk hb-11-E, "amod4.h11"  
spellchecked:rev:sol:10/24/94

## Appendix A

The following list shows the SIDs that require the battery box replacement lid and the SIDs that require only the label.

Replacement battery box lid required (ASOS class II systems installed before 6-10-93.) Each SID requires one battery box lid for the ACU and one battery box lid for the DCP. SIDs marked with a "+" require an additional battery box lid for each additional DCP. (Part required: ASN S100-FMK028-038)

ACT	ACY+1	ADQ	AGS	AKO	ALS	AMA
AST	ATY	ATL+1	BFF	BFM	BGM	BIS
BIX1	BIX2	BIX3	BLU	BTR	CDS	CNK
CNU	COS	CSG	CSM	CYS	DAB	DDC
DHT	DSM	DTW+2	EMP	EWB	FCA	FNT
FOE	FSM	FYV	GAG	GCK	GEG	GLD
GRI	GTF	HBR	HFD	HLC	HLN	HUT
HVN	ICT	ILG	IXD	JAN	JAX	JEF
JKL	KNRS	LAW	LEX	LGB	LHX	LNK
LOZ	LVM	LWS	MCI+1	MCN	MCO+1	MHK
MKE+1	MLC	MLI	OIC	OKC	OLM	PAH
PBI	PHX	PIA	PNC	PUB	PWA	PWM
RFD	RSL	SAV	SCK	SGF	SLN	SMF
SMP	SMX	SNY	SPI	SPS	STJ	SUX
SXT	SYR	TOP	TRI	TUL	TUP	STO

Label only required for the SIDs listed below. (ASOS class II systems installed after 6-10-93 but before 11-15-93.) (Part required: ASN S100-FMK028-LABEL)

ABR	AKN	ALB	ALW	ANC	APN
ARB	AXN	AZO	BFD	BIL	BRO
BTL	BTM	BTT	BWG	BZN	CAK
CDB	CLE	CRW	DET	DVX+1	ELM
ENA	EPH	ERI	FAI	FOK	FSD
FWA	GCN	GGW	GKN	GRB	GRR
HOM	HON	HTL	HVR	IPT	JNU
KNFJ	KNGP+1	KNGW	KNJW	KNOG	KOLA
KOLW	KTN	LAN	LOU	MBS	MCG
MFD	MGW	MIC	MKG	MLS	MPV
MRI+1	MSO	MWH	ORH	ORT	PADK
PAQ	PDT	PIR	PLN	PSC	PTK
SCC	SFF	SIT	STC	STP	TAL
TYS	UCA	STO			

W/OSO321:BGMcCormick:713-1834:9/26/94  
WP Files: AMOD4.H11, Disk HB-11e  
Spellcheck sol 9/26/94